

**TITLE**

~~A TRANSPARENT, ELASTIC AND FREE-STANDING COMPOUND,  
SUCH AS FOR THE MANUFACTURE OF CANDLES, AND THE FREE-  
STANDING CANDLE OBTAINED WITH THE COMPOUND~~

## **CLAIM OF PRIORITY**

This application makes reference to, incorporates the same herein, and claims all benefits

accruing under 35 U.S.C. § 119 from an application entitled *A TRANSPARENT, ELASTIC AND SELF-SUPPORTING COMPOUND FOR THE MANUFACTURE OF CANDLES AND THE CANDLE OBTAINED WITH SAID COMPOUND* earlier filed in the Argentina National Institute of Industrial Property on September 15, 2000, and there duly assigned Application Number P 000104870 by that Office and another application entitled *A TRANSPARENT, ELASTIC AND FREE-STANDING COMPOUND, FOR THE MANUFACTURE OF CANDLES, AND THE FREE-STANDING CANDLE OBTAINED WITH THE COMPOUND* earlier filed in the Argentina National Institute of Industrial Property on June 21 2001, and there duly assigned Application Number P 010102961 by that Office.

## **BACKGROUND OF THE INVENTION**

#### **Field of the Invention**

A main object of this invention is to provide a transparent, elastic and free-standing compound, such as for the manufacture of candles, and the candle obtained with this compound. The component of the present invention is suitable as a raw material in the manufacture of candles in general, thereby providing new possibilities for the structure of candles, which are

1 difficult to achieve or obtain with the materials that are currently used in the main structure of  
2 candles, although possible uses for the compound of the present invention should not be  
3 construed in a limiting sense. "Transparent" is understood to mean the condition of allowing the  
4 passing of the light through the compound, such as through the body of a candle. "Elastic" is  
5 understood to mean the characteristic of allowing contraction and elongation deformations of the  
6 compound, when pressing the surface of the compound and then the compound, such as a candle  
7 made with the compound, returning to an original shape when the pressure is released.

8 Further, " free standing" is understood to mean the compound, such as a candle made  
9 with the compound, having the ability to stand by itself at room temperature, such that even  
10 during use of a candle made with the compound, such that the heat of the candlewick's  
11 combustion does not melt nor deform the body of the candle made with the compound of the  
12 present invention.

13

14 **Description of the Related Art**

15 Traditional candles are known, such as those to be ignited and give light, which are  
16 formed having longer bodies, generally cylindrical, and with a lengthened candlewick included  
17 therein in relation to the candle's longitudinal axis. Such traditional candles are manufactured  
18 with materials such as paraffin, wax, tallow or stearin. However, such conventional candles have  
19 the inconvenience that, though being self supporting, they are not transparent nor elastic, so their  
20 decorative and ornamental abilities are limited.

1       Also, there is a well-known "oil candle" that is liquid, and therefore, requires a container  
2 for its manufacture and for usage of the candle. However, such "oil candle" is typically  
3 disadvantageous as to decorative abilities and with respect to the outside structure of the candle  
4 since, invariably, such "oil candles" depend on a recipient that contains the fuel. Further,  
5 compounds for such "oil candles" have to be commercialized separately, since such candle has to  
6 be conformed by the user.

7              Different realizations disclosing compound compositions that can be applied to the  
8 formation of candles are known and include a mixture of hydrocarbon oil in a range between  
9 90% and 70% proportion and one or more copolymers selected from a group of triblock and  
10 diblock polymers in a range between 2% and 30% proportion. This is due to the fact that, with  
11 such proportions, it is possible to form solid and transparent gels that can be molded by thermal  
12 treatment. However, it is not disclosed that such above-described transparent gels can conform  
13 to the body of a free-standing candle which does not deform nor flash when burned during its  
14 use.

15              In this regard, U.S. Patent No. 5,879,694 to Morrison *et al.* teaches a solid transparent gel  
16 candle including a hydrocarbon oil, a wick, and one or more triblock or multiblock copolymers,  
17 which constitute a thermoplastic elastic, and optionally uses a diblock copolymer. The preferred  
18 composition disclosed by Morrison *et al.* '694 contains from about 4% to about 20% polymer  
19 and about 80% to about 96% of hydrocarbon oil, preferably white oil. The selected polymer is a  
20 triblock polymer as "Kraton® G type", more particularly "Kraton® G-1650". In this regard,  
21 Morrison *et al.* '694 discloses that preferably, clear glass jars are used for a jar candle.

1       Also, US Patent No. 6,066,329 to Morrison *et al.* discloses a transparent stiff gel candle  
2       including a hydrocarbon oil, a wick and one or more triblock or multiblock copolymers of a  
3       thermoplastic rubber, and optionally, a diblock copolymer. A preferred composition disclosed in  
4       Morrison *et al.* '329 contains from about 4 to about 20 percent of the polymer and from about 80  
5       to about 96 percent of a suitable hydrocarbon oil, preferable white oil. A preferred polymer is  
6       disclosed as a triblock polymer of the "Kraton® G type" particularly "Kraton® G 1650".  
7       Morrison *et al.* '329 also discloses as preferable to hold the candles in conventional jars, clear,  
8       colored, sculpted, cut glass jars, and preferably, clear glass jars are used for a jar candle.

9       US Patent No. 6,096,102 to Matthäi *et al.* disclose in particular, a candle built of a base  
10      material including between 93 and 98 weight percent of hydrocarbon oil "white oil" and between  
11      7 and 10 weight percent of a copolymer selected from the group of tri-block, radial block and  
12      multiblock copolymers and between 0 and 10 weight percent of a di-block copolymer. Matthäi  
13      *et al.* '102 combines a first component, which is formed by an oil, a copolymer and synthetic  
14      paraffin, with a second component including conventional paraffin, where the first component  
15      and the second component are arranged ,alternately, in layers. In addition, Matthäi *et al.* '102  
16      disclose that a transparent glass body is provided which surrounds a region of a candle base  
17      material and gives the candle structure.

18       US Patent No. 5,578,089 to Elsamaloty discloses a clear candle made with a gel  
19      including a mineral oil combined with diblock and triblock copolymers based on synthetic  
20      thermal plastic rubbers. The clear candle is disclosed as stable, does not separate and does not  
21      flash when burned. The candle, it is disclosed, although free standing at room temperature, will

1 preferably be supplied in a container, and it may be colored and/or scented. However,  
2 Elsamaloty '089 discloses that the container for a candle can include any of a variety of devices  
3 which can contain the gel, do not burn and do not melt, and, preferably, a faceted glass container  
4 can be used for aesthetic purposes. While Elsamaloty '089 discloses a clear candle could be  
5 provided without a container, due to the gel-like nature of the candle itself, and its potential  
6 flowability when heated, Elsamaloty '089 discloses that it is preferred that such candles include  
7 an appropriate container.

8 Further, U.S. Patent No. 6,111,055 to Berger *et al.* disclose the use of between 70 and 98  
9 weight percent of hydrocarbon oil with between 2 and 30 weight percent of a copolymer selected  
10 from a group of triblock, radial block and multiblock copolymers, and from 0 to 10 weight  
11 percent of a diblock copolymer. Berger *et al.* '055 also discloses the combination of a candle  
12 with the use of a solid coating placed around the candle to enhance mechanical stability of the  
13 gelled body.

14

15 **SUMMARY OF THE INVENTION**

16 *It is an object, among other objects, of the present invention, to provide a transparent,*  
17 elastic and free standing compound for the manufacture of free standing candles, formed with a  
18 mixture of a hydrocarbon oil in a relation of about 75 to about 88 in weight percent, typically 73  
19 to 88 weight percent and desirably 83.8 weight percent, and at least one copolymer selected from  
20 the group of triblock polymers and diblock polymers in a proportion from about 12 to about 25  
21 in weight percent, typically 12 to 27 weight percent and desirably 16.2 weight percent where the

*Inv A2  
Cont.* ~~hydrocarbon oil has a viscosity of at least 180 SUS@ at 37°C (100°F) and, when the viscosity is~~

2 ~~in CST@, the viscosity of the hydrocarbon oil being greater than 32 CST@ at 40°C (104°F), and~~  
3 ~~the hydrocarbon oil having flash point greater than 220°C (425°F).~~

4 In a preferred embodiment of the compound of the present invention, the hydrocarbon oil  
5 has a viscosity of 340 SUS@ at 37°C (100°F) and when the viscosity is in CST@, the  
6 hydrocarbon oil has a viscosity greater than or equal to 67.8 CST@ at 40°C (104°F), the  
7 hydrocarbon oil has a flash point at 240°C (464°F), and the selected copolymers are three-block  
8 polymers "Kraton ® G 1652".

9 Likewise, it is also the object, among other objects, of the present invention, to provide a  
10 free standing candle, manufactured with the mixture of: a hydrocarbon oil in a relation of about  
11 75 to about 88 in weight percent, typically 73 to 88 weight percent polymers and desirably 83.8  
12 weight percent, and at least one copolymer selected from the group of triblock and diblock  
13 polymers in a proportion of about 12 to about 25 in weight percent, typically 12 to 27 weight  
14 percent and desirably 16.2 weight percent; where the hydrocarbon oil has a viscosity of at least  
15 180 SUS@ at 37°C (100°F) and when the viscosity is in CST@, the viscosity of the hydrocarbon  
16 oil is greater than 32 at 40°C (104°F), and the flash point of the hydrocarbon oil being greater  
17 than 220°C (425°F), the candle maintaining a free standing condition when is lit by means of a  
18 flame produced as consequence of the combustion of a wick, the wick crossing the body of the  
19 candle and projecting toward outside one of its ends. Preferably, the candlewick is a cotton  
20 string, imbibed in an alcoholic solution of vegetal resin, such as pine resin. In the present  
21 invention due to the elasticity of the candle's compound, the candlewick is firmly retained in a

*160*  
*162* ~~>passing hole produced when the compound of the present invention is cold, the candlewick~~  
*164*  
2<sup>05</sup> crossing the body of the candle in longitudinal correspondence to an axis of symmetry extending  
3 from an inferior or lower base of the candle.

4 Due to the above described special characteristics of the compound of the present  
5 invention, a free standing candle can be built by the union of a plurality of different format minor  
6 portions, wherein the minor portions are and individually made with a mixture of a hydrocarbon  
7 oil in a relation of about 75 to about 88 in weight percent, typically 73 to 88 weight percent  
8 desirably 83.8 weight percent, and at least one copolymer selected from the group of triblock  
9 polymers and diblock polymers in a proportion from about 12 to about 25 in weight percent,  
10 typically 12 to 27 weight percent and desirably 16.2 weight percent, where the hydrocarbon oil  
11 has a viscosity of at least 180 SUS@ at 37°C (100°F) and, when viscosity is in CST@, the  
12 viscosity of the hydrocarbon being greater than 32 CST@ at 40°C (104°F), and the flash point of  
13 the hydrocarbon oil being greater than 220°C (425°F).

14 Also, the above-described mixture or composition of the present invention can include  
15 dye essences, which can be combined with aromatic fragrances, as well as air bubbles distributed  
16 in the part or all of the thickness of the candle and the air bubbles can be of different sizes.  
17 Likewise, the candle body of the present invention can include decorative elements arranged in  
18 the inner part of the thickness of the candle, which, due to the particular transparency of the  
19 compound of the present invention, the decorative elements can be visible from outside of the  
20 candle, which decorative elements are located in the portion of the compound forming the candle  
21 not adjacent to the candlewick.

1                   **BRIEF DESCRIPTION OF THE DRAWINGS**

2                 A more complete appreciation of this invention, and many of the attendant advantages  
3                 thereof, will be readily apparent as the same becomes better understood by reference to the  
4                 following detailed description when considered in conjunction with the accompanying drawings  
5                 in which like reference symbols indicate the same or similar components, wherein:

6                 Figure 1 is a perspective view illustrating an embodiment of a mold to conform a free  
7                 standing candle made with the compound of the present invention;

8                 Figure 2 is a perspective view illustrating a free standing candle of the present invention  
9                 molded in the mold for Figure 1;

10                Figure 3 is a perspective view illustrating an embodiment of a free standing candle of the  
11                present invention formed by a plurality of minor portions made with the compound of the present  
12                invention and united one with each other to form a unitary candle body;

13                Figure 4 is a schematic perspective view illustrating a free standing inflamed candle of  
14                the present invention with the candlewick of the candle consumed to approximately half its  
15                height;

16                Figure 5 is a schematic perspective view illustrating an embodiment of a free standing  
17                inflamed candle of the present invention formed with the compound of the present invention,  
18                which includes a plurality of lit candlewicks;

19                Figure 6 is a schematic perspective view illustrating an embodiment of a free standing  
20                candle of the present invention formed with the compound of the invention, which includes  
21                granule particles, such as "purpurin" as a decorative element;

1 Figure 7 is a schematic perspective view illustrating an embodiment of a free standing  
2 candle of the present invention formed with the compound of the invention, which includes air  
3 bubbles; and

4 Figure 8 is a schematic perspective view illustrating an embodiment of a free standing  
5 candle of the present invention formed with the compound of the invention, which includes  
6 decorative elements.

## **DESCRIPTION OF THE INVENTION**

More specifically, the present invention relates to a compound obtained from the mixture of hydrocarbon oil, specially white oils, and block copolymers. The present invention relates to a compound, such as for use in a candle, that has a consistency to be free-standing, and maintaining elasticity features, while the compound maintains transparency, as well as the compound enabling the configuring of bodies of various shapes and designs. The compound of the present invention, has the special particularity of allowing the incorporation of at least one candlewick in to the candle, similar to those used by candles in general, to provide a combustion of a candle made with the compound of the present invention that generates a stable and lasting flame without giving off unpleasant odors.

18 The compound of the invention has been particularly created for the manufacture of  
19 transparent candles which, at the same time are free-standing, that is to say, which do not need a  
20 container that supports a candle made from the compound of the present invention. Candles  
21 made from the compound of the present invention also are elastic and unbreakable when they fall

1 or receive sudden knocks, and such candles made from the compound of the present invention  
2 desirably can be mixed with dyes and aromatic fragrances, as well as can include decorative  
3 elements within the candle that are noticeable from outside, or that provide other or inner  
4 functional resources related to the art of lighting and decorating different environments.

5 The above described composition of the present invention, in summary, advantageously  
6 has special qualities: it is transparent, free standing and elastic, with enough consistency to form  
7 a candle with a stable flame, that does not deform upon application of pressure and that does not  
8 get fluid during its use, such as when the candlewick is burning.

9 Using the compound of the present invention, it is possible to manufacture candles to  
10 have the following desirable features:

11 a) elasticity, so as to present a consistency solid enough to be self-supporting,  
12 without requiring a container for supporting the candle for its normal functioning;

13 b) resistance or resiliency to mechanical knocking or jarring without generating  
14 undesirable breaks, splits or contusions in the candle, as can happen with paraffin candles;

15 c) transparency, so that light can pass through the body of the candle;

16 d) the ability to be mixed with fragrances, so that the consumption of the candle  
17 during the flame action of burning of the candlewick or wicks also produces the release of  
18 pleasant odors;

19 e) the ability to be mixed with dyes, which is desirable from an aesthetic or  
20 ornamental point of view

1                 f) during manufacturing, generating the presence of air bubbles of various sizes such  
2 that distribution of air bubbles in the body of the candle can be achieved, which is useful as  
3 decorative resources;

4                 g) mixing the compound of the present invention with other decorative elements  
5 such as various types and sizes of granule particles so as to be distributed in the thickness of the  
6 candle body, so as to be visible from outside of the candle, and decorative elements can be even  
7 more enhanced when the candle is lit, such as granule products that reflect light in various colors,  
8 such as those commonly called "purpurin" and/or "brillantine";

9                 h) supporting within the body of the candle of an appropriate thickness, other  
10 products or decorative bodies such as letters, numbers, little animals or other objects; and

11                 i) the compound of the present invention being a reversible or recyclable compound,  
12 since upon heating, melting, and then cooling the compound to room temperature, the candle  
13 formed of the compound of the present invention keeps the same constituent features.

14                 Likewise, it is highlighted that all of the above described features and conditions in  
15 relation to the composition of the present invention can be maintained without affecting each  
16 other.

17                 The reasons for the composition of the present invention providing superior and  
18 unexpected type results, are related to the chemical characteristics of the hydrocarbon oil, such as  
19 a white oil. When the values for the hydrocarbon oil and copolymer specified for the  
20 composition of the compound of the present invention are maintained, a very special relation  
21 between the viscosity and the flash point is achieved. In this regard, when the values of the

1 hydrocarbon oil and copolymer are below the specified values for the composition of the present  
2 invention, the compound could be free standing at room temperature but the heat of the wick's  
3 combustion can melt the compound to a liquid point. On the other hand, when more polymer  
4 than what is specified in the present invention is used to harden the compound or composition,  
5 the compound or composition can inflame with the combustion produced by the candle's wick.

6 The above-described compound of the present invention is prepared mixing the  
7 hydrocarbon oil with a triblock copolymer, heating this mixture and stirring it regularly until it  
8 reaches 150-160° C, which is equivalent to 302-320° F. Stirring the mixture, mechanically or  
9 manually, is convenient to achieve the desirable dissolution of the polymer in the hydrocarbon  
10 oil. The hydrocarbon oil used for the compound of the present invention is desirably white oil  
11 ("Vaseline") having the following characteristics as set forth in <TABLE 1>.  
*12 A3*

TABLE I

Specification	Value	Method
VISCOSITY SUS @ 37.8°C (100°F)	345	ASTM D 88
VISCOSITY CST @ 40°C (104°F)	32 (67.8)	ASTM D 445
DENSITY @ 20°C (68°F)	0.88	ASTM D 1298
FLASH POINT	240° C (464°F)	ASTM D 97
TURBIDITY POINT	-5° C (23° F)	ASTM D 2500
COLOR AL PT-CO (EX ALPHA)	10	ASTM D 1209

ASTM= American Society for Testing and Material (site:www.astm.org)

METHOD= Method of analysis

SUS @ and CST@ (centistokes) are measure units of each essay

*Ami AY*

Two of these values for the hydrocarbon oil of TABLE 1 are very important when choosing the hydrocarbon oil, such as the white oil ("Vaseline"), which are: the flash point desirably should not be inferior to or less than 200°C (392 °F) and the viscosity desirably should not be inferior to or less than 32 CST@, desirably at least 67.8 CST@.

The other values for the hydrocarbon oil in TABLE 1 can change, dependent upon the specifications of the product, without altering the preparation of the compound of the present invention.

In relation to the triblock copolymer used in the above-described composition or compound of the present invention, the most desirable is a triblock copolymer with polystyrene end blocks and a rubbery poly (ethylene butylene) mid block. The polymer used in the preparation of compound of the present invention desirably should have the following preferred characteristics as set forth in <TABLE 2>.

14 <TABLE 2>

Tensile strength, psi	4,500
Elongation at break, %	500
Modulus at 300% extension, psi	700

Film appearance	Clear, water white
Solution viscosity *25% w in toluene,cps	1800
Melt viscosity, melt index, condition G, Gms-10 min	1
Styrene-rubber ratio	30-70
* Brookfield viscosity meter Model RTV to 25°C (77°F)	

1 Polymers that better suit the above-described characteristics set forth in <TABLE 2> are

2 Kraton® G 1652 of Shell Chemicals, for example.

3 To prepare the above-described compound of the present invention, hydrocarbon oils are  
4 used that have the feature of remaining liquid within a temperature range between 0°C(32°F) and  
5 200 °C (392°F), as well as the condition of being transparent and of high density. One of the  
6 hydrocarbon oils that best adapts to these conditions is a 180 density white oil ("Vaseline").  
7 Likewise, for the composition of the compound of the present invention the above-described  
8 polymers are used.

9 The first step in preparing the composition or mixture of the present invention is to mix  
10 two-block or three-block polymers, especially an S-EB-S chain, which are capable of retaining  
11 more than twenty times its weight in hydrocarbon oil. Among known polymers suitable for use  
12 in the present invention, there are different kinds of polymers, but those of "Kraton® Series G"  
13 are the best or preferred for use in the composition or mixture of the present invention. These  
14 "Kraton® G" series polymers correspond to a type of three-block polymer, such as "S-EB-S"  
15 type. It is also possible to use "Kraton® Series D" type, but they typically do not achieve as

1 good a result as in the previous case. The quantity of polymer to be used in the compound or  
2 mixture of the present invention relates to the level of hardness intended for the mixture.

3 Starting from the previously mentioned elements of the hydrocarbon oil and copolymer,  
4 the process then proceeds to mix the mixture of the hydrocarbon oil and copolymer through  
5 normal stirring, at a temperature ranging from 80 °C (176°F) to 160 °C (320°F), up to the  
6 solubilization of the mixture and that leaves the solution transparent.

7 Referring to Fig. 1, for the pouring in molds, materials of container P and mold M of  
8 delicate finish and that resist temperatures up to 160 °C may be used. Varying the temperature  
9 and speed of pouring of the mixture or compound C of the present invention these can be  
10 obtained variations in relation to the final finish of the compound C of the present invention,  
11 which can include air bubbles of different sizes or can be without air bubbles. In Fig. 1 a mold  
12 M for the function of forming a candle of the present invention is illustrated, the mold M having  
13 a completely open superior or upper base, and the mold M having an internal diameter a and a  
14 height b, as illustrated in Fig. 1. For the pouring of the compound C from the container P to  
15 inside the mold M, the mold M must be able to resist without deforming temperatures of up to  
16 160° C (320 ° F), and in this regard, stainless steel, brass, aluminum, copper , bronze, silicon  
17 rubber *etc.* are the most convenient and desirable materials used for the mold M. In relation to  
18 the interior surface 1 of the mold M, it is very important that the interior surface 1 be brilliant,  
19 neat and polished, so that the compound C when formed into a candle of the present invention  
20 will have the same neatness and brightness. By changing the temperature and the speed of the

1 pouring of the compound C from the container P to inside the mold M, various different finishes  
2 can be obtained for the candle of the present invention.

3 Once the compound C cools in the mold M to room temperature, a completely clear,  
4 transparent compound without air bubbles is obtained when pouring the compound C in the mold  
5 M at a temperature between 150°C(302°F) and 160°C (320°F) to provide a clear, transparent  
6 candle as candles 100, 100A, 100B and 100C of Figs. 2 through 5.

7 When the temperature of the compound C is between 100°C(212°F) and 120°C(248°F)  
8 when pouring the compound C into the mold M, the compound C will have air bubbles 2 when it  
9 cools to room temperature to provide a clear, transparent candle having air bubbles 2, such as  
10 candle 100E of Fig. 7. Air bubbles 2 can also appear in the compound C when the speed and the  
11 height of the pouring are changed, since that allows the entrance of more air or less air into the  
12 compound C.

13 Figure 2 represents a free standing candle 100 already formed according to the format  
14 and dimensions of the mold M of Fig. 1. For the shaping of a candle of the present invention, the  
15 compound C is capable of keeping the candlewick 3 in a similar way as it is disposed in  
16 conventional candles. Conventional paraffin candlewick, as well as candlewicks for gel or  
17 especially prepared for these types of candles, such as a cotton string imbibed in a solution of  
18 vegetal resin, such as pine resin, can be used for candlewick 3. The candlewick 3 can be placed  
19 during the manufacture of the candle, such as candle 100, in the traditional way, that is to say,  
20 arranging same in correspondence with the longitudinal axis X of the mold M and the candle  
21 extending from a lower base 1a of the candle (Figs. 1 and 2) and fixing the candlewick 3 so as to

1       be stretched or erected so as not to move while the mixture or compound C is poured into the  
2       mold M.

3           It is also possible to place candlewick 3 in the candle by taking advantage of the feature  
4       of elasticity of the compound C of the present invention. Therefore, once the candle has been  
5       shaped in the mold M, these is made an aperture or a passing hole 4 in the candle, such as  
6       candles 100B and 100D of Figs. 4 and 6 through which the entire candlewick 3 moves forward  
7       till the candlewick 3 is arranged in a condition of usage in the candle. The passing hole 4 is  
8       produced when the candle desirably is at room temperature, the passing hole 4 extending through  
9       the candle in longitudinal correspondence to an axis of symmetry L extending from a lower base  
10      B of the candle, such as in candles 100B and 100D of Figs. 4 and 6. The candlewick 3 is kept  
11      stable in the candle, such as in candles 100B and 100D, without relative displacement due to the  
12      mentioned elasticity of the material or compound C of the present invention.

13           Considering the foregoing, it is possible to shape candles, such as candles 100 through  
14      100F of Figs. 2 through 8, of different sizes and dimensions, which will have a minimum size  
15      that depends on the candlewick 3 size used, since the combustion temperature generated and the  
16      quantity of adjacent material melted of the candle depends on the type and proportions of the  
17      candlewick 3 used in the candle. It is possible to manufacture candles of different forms and  
18      sizes taking into account the candlewick 3's thickness and the melting diameter of the candle in  
19      relation to candle's minimum diameter.

20           In the candles of the present invention, such as candles 100 through 100F, providing a  
21      candle diameter larger than the melting diameter of the candle, a decorative effect can be

1 achieved that is highly pleasant, since the portion of the material or compound C in the candle  
2 that is not melted keeps its original structure. For example, a candle of a diameter which is twice  
3 the melting diameter of the candle produced during the combustion of a candlewick 3, 3a, 3b, 3c,  
4 produces a tunneling 5, 5a, 5b, 5c since the candlewick's flame 6, 6a, 6b, 6c will melt a certain  
5 diameter of the compound C around the candlewick 3, 3a, 3b, 3c but the rest of the candle will  
6 remain unchanged. The flame 6, 6a, 6b, 6c consumes the candlewick 3, 3a, 3b, 3c during the  
7 combustion and, as consequence, the candlewick 3, 3a, 3b, 3c- is shortened by such combustion,  
8 and the light produced by the flame 6, 6a, 6b, 6c inside the candle, such as candles 100B through  
9 100F of Figs. 4 through 8, for example, will go through the transparent body of the candle  
achieving a very special, beautiful and unique effect.

11 Fig. 3 illustrates a free standing candle 100A of the present invention built with a  
12 plurality of minor portions 7, 8 and 9 of the compound C, the minor portions being of different  
13 sizes and forms. The minor portions 7, 8 and 9 forming the candle 100A can be formed by  
14 different methods, such as molding, lamination, extrusion, *etc.* When the minor portions 7, 8 and  
15 9 are united one with the other to form a unitary structure, a free standing candle 100A as  
16 illustrated in Fig. 3, having properties of candles of the present invention, as previously  
17 mentioned is provided.

18 The compound C's shapes and formats obtained for the above-mentioned minor portions,  
19 such as minor portions 7, 8 and 9, can be laminar, cylindrical, rectangular, and any other suitable  
20 design. By using heat to melt the compound C of the present invention in the desired joint point  
21 J of two of the minor portions obtained, the melted compound of both minor portions will mix

1 and, once cooled, the minor two portions are united forming one single piece of a unitary  
2 structure. This allows an artist, for example, to design and manufacture candles of varying  
3 shapes and designs by making and joining minor portions formed of the compound C of the  
4 present invention having different colors, finishes and shapes.

5 Referring to Fig. 5, an embodiment of a candle 100C of the present invention is  
6 illustrated formed of the composition C of the present invention that allows the formation of free  
7 standing candles of a relatively large diameter so as to allow the placing of more than one  
8 candlewick 3 in the candle. In the candle 100C of Fig. 5, a plurality of candlewicks 3a, 3b, 3c  
9 are illustrated which are reduced by their combustion generating tunnelings 5a, 5b, 5c lightened  
10 with flames 6a, 6b, 6c.

11 Further, the compound C of the present invention also allows the possibility of compound  
12 C of candles 100 through 100F of Figs. 2 through 8 being mixed with colorants by adding dyes  
13 to color the compound C and, also, the compound C of candles 100 through 100F of Figs. 2  
14 through 8 can be mixed with aromatic fragrances to perfume the ambient air during the  
15 combustion of the candlewicks 3a, 3b, 3c.

16 Additionally, Fig. 6 illustrates a candle 100D of the present invention where the  
17 compound C of the present invention has been mixed with a granular material 10, such as  
18 "purpurin", for example.

19 Also, Fig. 8 illustrates a candle 100F of the present invention where the body of the  
20 candle 100F has a plurality of different decorative elements 11a through 11d, for example,  
21 distributed in the interior of the candle 100F. The placing of the decorative elements 11a

1 through 11d, for example, in the body of the candle 100F can be allowed by placing the  
2 decorative elements 11a through 11d, for example, in the compound C of the present invention  
3 once is poured from container P into the mold M (Fig. 1) and before the compound cools to room  
4 or ambient temperature. Such decorative elements can also include a logo, a name, a picture, an  
5 object, etc., for example, set in the compound C of the candle before cooling of the compound to  
6 room or ambient temperature. The compound C of the present invention will hold the decorative  
7 elements 11a through 11d, for example, and, due to the compound C's transparency, the  
8 decorative elements 11a through 11d, for example, will be visible from outside of the candle,  
9 such as illustrated in candle 100F of Fig. 8.

10 The following Examples 1 and 2 are now described to illustrate exemplary embodiments  
11 of the compound or mixtures and candles of the present invention.

12

13 **Example 1:**

14 A mixture of the present invention containing white oil in a relation of 75 to 88 weight  
15 percent and a three-block polymer of "Kraton® G series" type in a relation of 25 to 12 weight  
16 percent was prepared. This compound was obtained heating the mixture at a temperature  
17 ranging between 100° C (212° F) and 160°C (320° F), desirably 150° C (302° F) to 160°C (320°  
18 F), stirring till the mixture becomes clear and transparent. In this case, a dye and an aromatic  
19 fragrance were added and the obtained mixture was poured in a cylindrical mold of 7 cm  
20 diameter and 7 cm of height proceeding to its cooling and hardening.

1       Once the mixture of compound is cooled, at room temperature, the demolding was  
2       accomplished and the placement of the candlewick or wick was performed. In this case the  
3       candlewick was formed by a cotton string imbibed in an alcoholic solution of pine resin. A  
4       passing aperture or passing hole in correspondence to the axis of symmetry of the cylindrical  
5       body of the candle was formed, in which the candlewick was introduced. From the above-  
6       described process, a free standing, transparent and color candle was obtained. The candle thus  
7       formed kept a flame, as a product of the combustion generated from the candlewick, which flame  
8       maintained constant during 40 continuous hours of burning.

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**Example 2:**

10       A mixture of the present invention of hydrocarbon oil and copolymer similar to that of  
11       Example 1 was prepared, and, previous to the stage of cooling, the mixture or compound thus  
12       prepared was poured in a plurality of different molds to provide a plurality of minor portions.  
13       These minor portions poured into the plurality of different molds were mixed with different  
14       coloring essences and then exposed to cooling individually, as explained previously. In this  
15       regard, different forms and shapes of compounds were obtained, such as sheets of different sizes,  
16       strings of different thickness, as well as portions without defined format, all of them in varying  
17       colors, as explained previously.

19       Using the above-mentioned minor portions in a solid state, a handmade design of  
20       different structures were performed assigned to shape candles; and the plurality of different  
21       minor portions were joined together, applying heat, thus obtaining candle bodies of different

1 shapes and sizes, as explained previously, having a unitary structure for the candle body formed  
2 from the different minor portions. A corresponding candlewick was introduced in the body of  
3 the thus formed candle, following the same method explained in the previous Example 1.

4 While there have been illustrated and described what are considered to be preferred  
5 embodiments of the present invention, it will be understood by those skilled in the art that  
6 various changes and modifications may be made, and equivalents may be substituted for  
7 elements thereof without departing from the true scope of the present invention. In addition,  
8 many modifications may be made to adapt a particular situation to the teaching of the present  
9 invention without departing from the scope thereof. Therefore, it is intended that the present  
10 invention not be limited to the particular embodiments disclosed as the best mode contemplated  
11 for carrying out the present invention, but that the present invention includes all embodiments  
12 falling within the scope of the appended claims.